Deep Ridge Nature Reserve
Property Management Plan
Salt Spring Island, BC

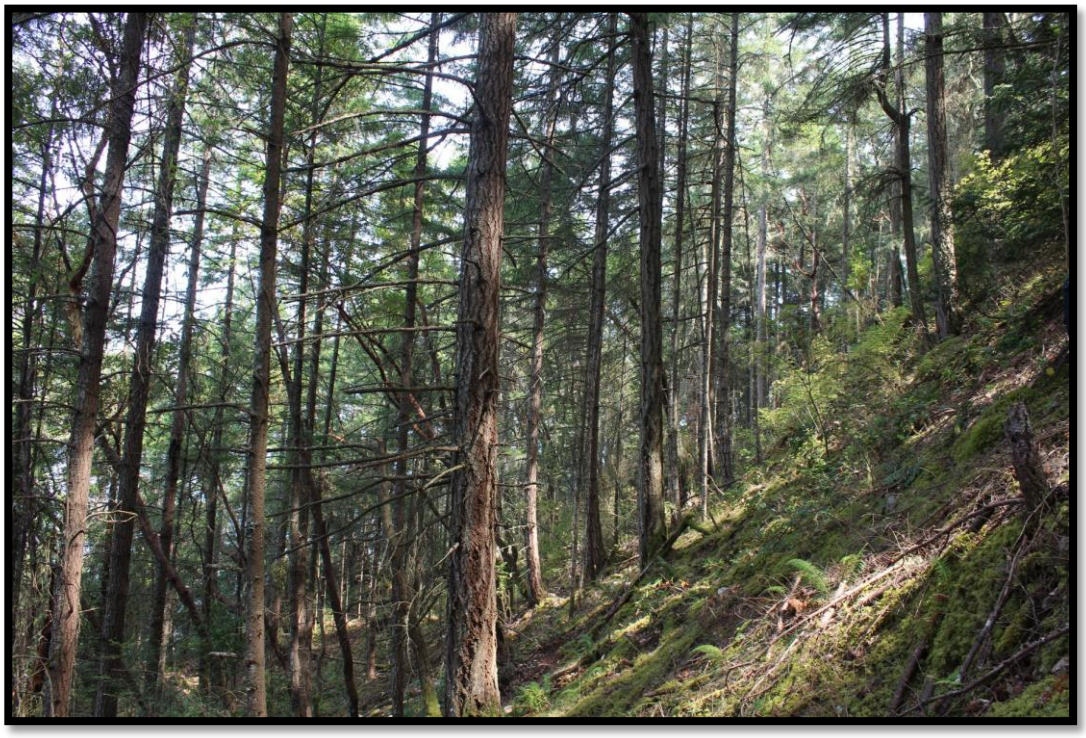

Photo 1. Maturing second growth forest in Deep Ridge Nature Reserve, Salt Spring Island.

Prepared for:
Islands Trust Conservancy

ISLANDS TRUST CONSERVANCY
Protecting Islands in the Salish Sea

Deep Ridge Nature Reserve Management Plan
Prepared: February 1994
Revised: November 2004 by J. Ussery

Revised: January 2020 by Carrina Maslovat

APPROVED BY
Islands Trust Conservancy Board on January 26, 2021; Resolution ITC-2021-004

i. Executive Summary

Islands Trust Conservancy acknowledges and respects that Salt Spring Island is within the territory of Coast Salish Peoples, the Cowichan Tribes, Halalt First Nation, Lyackson First Nation, MÁLEXEŁ (Malahat) Nation, BOḰEĆEN (Pauquachin) First Nation, Penelakut Tribe, SEMYOME (Semiahmoo) First Nation, Stz'uminus (Chemainus) First Nation, W̱JOŁEŁP (Tsartlip) First Nation, SȾÁUTW̱ (Tsawout) First Nation, Tsawwassen First Nation, W̱SIḴEM (Tseycum) First Nation, Ts'uubaa-asatx (Lake Cowichan) First Nation. The historical relationship to the land, culture, and spirit of this place continues to this day. Islands Trust Conservancy is committed to honouring the rich history of Indigenous stewardship in the lands and waters of the Islands Trust Area and to building mutually respectful relationships between Indigenous and non-Indigenous partners in conservation. Therefore, this Management Plan for Deep Ridge Nature Reserve is a living document that will evolve as opportunities for knowledge sharing arise and understanding grows[1].

The Deep Ridge Nature Reserve was donated to the Islands Trust Conservancy (ITC) in 1992 by Jonathon and Evelyn Oldroyd and Robert and Rosemary Trump. The Ministry of Transportation and Highways and the Capital Regional District hold a restrictive covenant on the land, which was executed in 1992. The initial management plan was prepared in 1994, revised in 2004 by Joel Ussery, and updated in 2019 by Carrina Maslovat.

The Reserve is located on the southeast coast of Salt Spring Island, south of Cusheon Creek. It is 14.18 hectares (35.05 acres) in size, measuring 1.6 kilometres long by 14-150 metres wide. The land is a strip of steeply-sloping, forested ridge that includes 14 metres of ocean front. The Reserve has been logged and is currently a young forest which will mature into a red-listed ecological community. There are a number of wildlife trees, primarily small diameter standing dead trees. Two species at risk have been observed on the land, leafless wintergreen and Northern Red-legged Frog.

The Reserve provides a buffer to the adjacent regionally-managed Peter Arnell Park and is an important protected area in the Coastal Douglas-fir moist maritime (CDFmm) subzone on Salt Spring Island. Key management recommendations are to restore unsanctioned trails, remove invasive species, install Islands Trust Conservancy boundary signage and develop a wildfire management plan. Further inventories for species at risk would provide a clearer picture of the ecology of the Reserve and guide future management.

[1] First Nations/reconciliation content written by Lisa Wilcox, Islands Trust

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Name	**Position/Affiliation**	**Professional Accreditation or subject expertise**	**Contribution**
Carrina Maslovat	Botanist/Contractor	R.P. Bio.	Primary author, field data collection
Laura Matthias	Species at Risk Biologist/Subcontractor		Assistance with field data collection
Lisa Wilcox	Senior Intergovernmental Policy Advisor	B.A. Psychology Indigenous Knowledge Holder	Reconciliation/Indigenous Knowledge Holder and editing
Jemma Green	Acting Property Management Specialist/Islands Trust Conservancy		Background information and mapping, local contacts
Nuala Murphy	Property Management Specialist/Islands Trust Conservancy		Background information, document review
Joel Ussery	Contractor		Author of management plan revision 2004

1.0 Introduction

Salt Spring Island is situated within the territory of the Coast Salish Peoples, who share a rich history of stewardship in the lands and waters of the Islands Trust Area that inspires the work of Islands Trust Conservancy and its partners. Deep Ridge Nature Reserve was established by the Islands Trust Conservancy in March, 1992 thanks to a donation by Jonathon and Evelyn Oldroyd and Robert and Rosemary Trump.

The initial management plan was approved by the Islands Trust Conservancy Board in February 1994. The plan was revised in November 2004 by Joel Ussery and approved by the Islands Trust Conservancy Board on November 29th, 2004. In 2020, the management plan was updated to be consistent with a new template and additional field work was required to update the plan.

1.1 Islands Trust Conservancy

Since time immemorial, the lands and waters between Vancouver Island and mainland British Columbia have been home to the Coast Salish People, whose ecological, cultural, and spiritual connections to this place continue to this day. In 1974, the Province of British Columbia recognized the islands between Vancouver Island and the mainland as a special place within the province where the unique beauty, rural character and diverse ecosystems should be protected for future generations. Through the Islands Trust Act, the province established the Islands Trust, a local government, with the following mandate (known as the Object of the Islands Trust):

> *To preserve and protect the trust area and its unique amenities and environment for the benefit of the residents of the trust area and of British Columbia generally, in cooperation with municipalities, regional districts, improvement districts, other persons and organizations and the government of British Columbia.* (Islands Trust 2019b)

In 1990, through the enactment of a section of the Islands Trust Act, the Islands Trust Conservancy (originally called the Islands Trust Fund) was established as a conservation land trust to assist in carrying out the "preserve and protect" mandate. Part 6 of the Islands Trust Act establishes the corporate status, responsibilities, and governance structure of the Islands Trust Conservancy. The Islands Trust Conservancy is one of sixteen corporate entities[2] charged to uphold the Object of the Islands Trust and since 1990 has protected over 1,300 hectares (3,220 acres) of land as nature reserves and conservation covenants.

The vision of the Islands Trust Conservancy is that the islands and waters of the Strait of Georgia and Howe Sound will be a vibrant tapestry of culture and ecology where humans live and work in harmony with the natural world. This special place will have a network of protected areas that preserve in perpetuity the native species and natural systems of the islands. Engaged residents and conservation partners will work together to protect large natural areas and key wildlife habitat. Viable ecosystems will flourish alongside healthy island communities.

[2] The corporate entities charged to uphold the Object of the Islands Trust are the Trust Council, the Executive Committee, twelve local trust committees, one island municipality and the Islands Trust Conservancy Board.

The mission of the Islands Trust Conservancy is to protect special places by encouraging, undertaking and assisting in voluntary conservation initiatives within the Islands Trust Area. Islands Trust Conservancy nature reserves are managed to maintain, preserve and protect the natural features and values of ecosystems.

1.2 Purpose of Islands Trust Conservancy Management Plans

ITC management plans provide background information and set out the direction of property management as follows:

- Provide general and descriptive information on the property, including location, history, and land use.
- Set out the conservation goals and objectives for the property.
- Identify the property's ecological and/or cultural values and features.
- Describe the management issues associated with the property.
- Provide short, medium and long-term management recommendations (action items or tasks) on issues such as: species at risk protection; ecological restoration; public access; educational and research opportunities; invasive species management; and signage needs.
- Preserve and protect cultural, spiritual, and sacred locations.

Once the management plan process is complete, the ITC will work to carry out the management actions or strategies identified in the plan, as resources allow. Following general practice, the ITC will revise the Management Plan every ten years.

1.3 Scope of Islands Trust Conservancy Management Plans

Consistent with the Islands Trust Reconciliation Declaration (Islands Trust 2019), ITC recognizes that nature reserves may be places of great cultural and spiritual significance to First Nations. Cooperative management of these protected places will provide opportunities to establish and maintain mutually respectful relationships between the Islands Trust Conservancy and First Nations, as well as upholding the guiding principles of United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP)[3] and the Truth and Reconciliation (TRC) Calls to Action. Relationship-building, knowledge-sharing, healing, and establishment of trust takes time. Islands Trust Conservancy is committed to developing a parallel *Management Plan for Areas of Cultural Heritage and Sacred Significance*. This parallel Management Plan sets out guiding principles for cooperative collaboration between ITC and First Nations with traditional and treaty territories and cultural interests in the area defined by one or more nature reserves. Moreover, the Management Plan defines the common vision, objectives, policies, and best management practices for the nature reserve(s) to ensure that its natural values and cultural heritage and sacred significance are maintained for future generations.

[3] The United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) is an international instrument adopted by the United Nations on September 13, 2007, to enshrine (according to Article 43) the rights that "constitute the minimum standards for the survival, dignity and well-being of the indigenous peoples of the world." The UNDRIP protects collective rights that may not be addressed in other human rights charters that emphasize individual rights, and it also safeguards the individual rights of Indigenous people. Canada signed in 2010.

1.4 Protected Area Purpose

The purpose of the Deep Ridge Nature Reserve is to preserve and protect the representative natural ecosystems and natural values of the site (including any rare and endangered plant and animal species), and to maintain the biodiversity of the site for the benefit of the flora and fauna of the Reserve, the residents of the island and the province generally. The site is to be protected in accordance with the objectives of the Islands Trust Conservancy and the mandate of the Islands Trust.

1.5 Protected Area Objectives

The objectives for Deep Ridge Nature Reserve are to:

- Preserve and protect the natural ecosystems, biological diversity and natural values;
- Support ongoing inventory, mapping and monitoring to guide management;
- Allow natural forest succession and natural ecological processes and functions to proceed unimpeded without human intervention, except in the case of wildfire or other exceptional situations where remediation is considered imperative;
- Support and protect continued use of areas of sacred and cultural significance by First Nations community members as per Section 35 of the Constitution Act[4] and UNDRIP;
- Remove invasive species throughout the Reserve where they compromise natural values; and
- Maintain a buffer for Peter Arnell Park thereby creating a larger contiguous protected area.

2.0 Property Information

The Deep Ridge Nature Reserve is a 14.18 hectare (35.05 acre) strip of forested ridge measuring 1.6 kilometres long by 14-150 metres wide. The property drops steeply just west of the oceanfront shoreline which is approximately 200 metres south of the mouth of Cusheon Creek. The Reserve includes 14 metres of ocean front.

Photo 2. Oceanfront shoreline of Deep Ridge Nature Reserve. Carrina is at the southeastern corner of the Reserve and the large tree in the foreground is at the northeastern corner.

2.1 Location

Deep Ridge Nature Reserve is located south of Cusheon Creek on the southeast coast of Salt Spring Island.

[4] Section 35 of the Constitution Act, 1982 recognizes and affirms the inherent rights of Indigenous Peoples.

Salt Spring Island can be accessed by ferries from Swartz Bay, Tsawassen and Crofton. From the Fulford Harbour ferry landing, follow Fulford-Ganges Road for 320 metres then turn right (north) onto Beaver Point Road. Turn left (northwest) after 2.5 kilometres onto Stewart Road. After approximately 2 kilometres, at the top of the hill, there is a sign on the left of the road for Peter Arnell Park and a parking area on the right side of the road for the park. Follow the main trail in Peter Arnell Park from the parking area to the east and keep to the left fork in the trail (to the north). The Reserve is approximately 95 metres from the parking lot along this trail.

2.2 Legal description

Deep Ridge Nature Reserve is legally described as PID: 018-031-552, Lot 3, Sections 75 and 76, South Salt Spring Island, Cowichan District, Plan VIP 55669.

2.3 Legal Access

A development variance permit (EF122838) has been granted under Part 29 (Management of Development) of *The Municipal Act* to exempt the property from requiring road frontage.

The Islands Trust Conservancy Board holds easement EF17032 over Lot 1, Plan 13496. The easement allows public access (foot traffic only) to the property through the regionally-managed Peter Arnell Park. There is a well-established trail that leads from Peter Arnell Park into the west portion of Deep Ridge Nature Reserve.

2.4 Landscape Context

Salt Spring Island is located in the Georgia Strait, one of the many islands governed by the Islands Trust (see map in Figure 1 for location and protected area context). Deep Ridge Nature Reserve is located on the southeast coast of Salt Spring Island, south of Cusheon Creek with views to Galiano Island and Active Pass.

In the western part of the Reserve, the regionally-managed 13 hectare (31 acre) Peter Arnell Park lies to the west and south of the property.

Except for Peter Arnell Park and the Bryant Hill – Peter Arnell linear connector trails, the rest of the properties close to the Reserve are privately-managed lots. Directly north of the Reserve is a privately-managed linear parcel that measures 19 hectares (48 acres). In the eastern part of the Reserve, to the south there are two large privately-managed lots measuring 29 hectares (72 acres) and 26 hectares (65 acres), the latter was logged prior to the 2004 management plan (Ussery 2004).

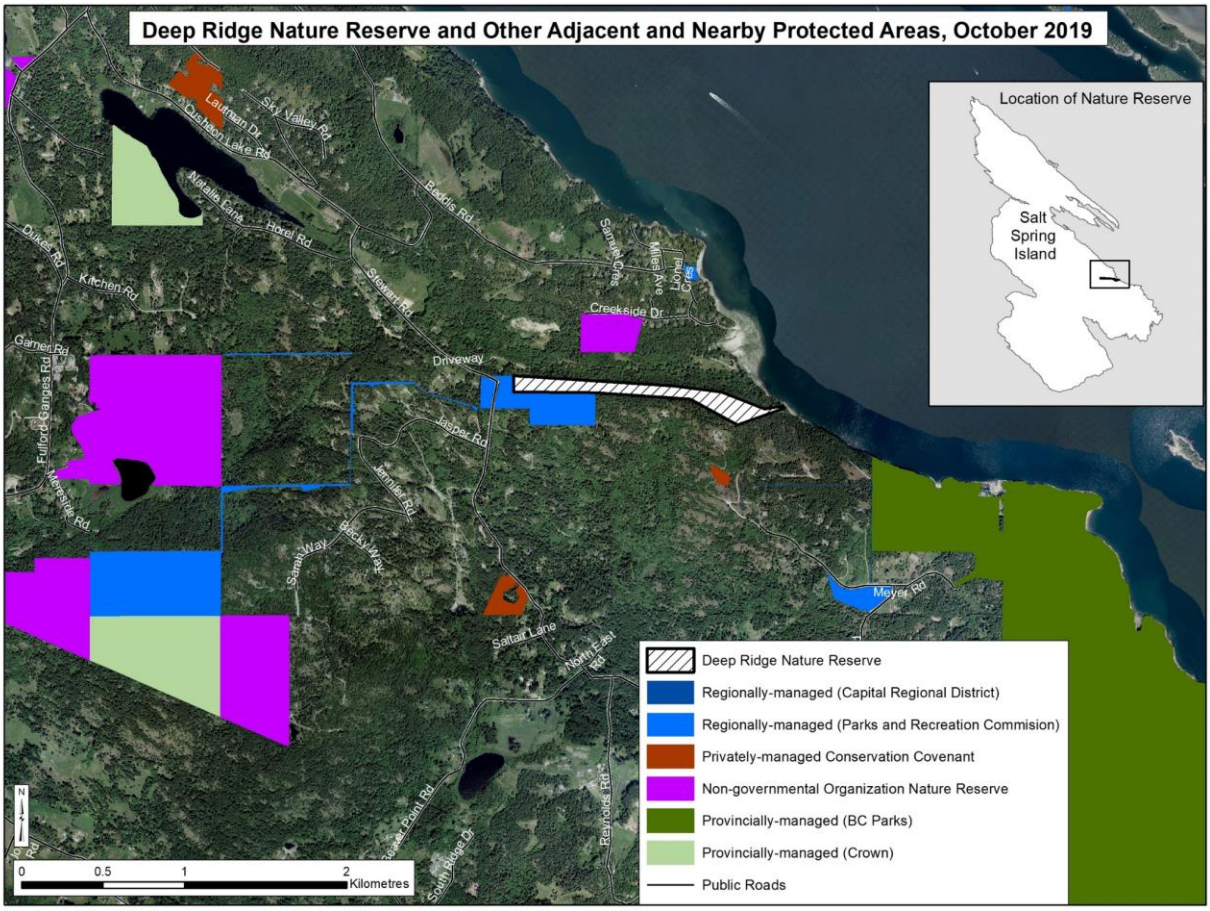

Figure 1. Location on Salt Spring Island (inset), and protected areas context surrounding the Deep Ridge Nature Reserve.

2.5 Site History

Salt Spring Island is within the treaty and territories of the Coast Salish People. The island has since time immemorial been the homeland and gathering place for First Peoples including the Cowichan Tribes, Halalt First Nation, Lyackson First Nation, MÁLEXEŁ (Malahat) Nation, BOḰEĆEN (Pauquachin) First Nation, Penelakut Tribe, SEMYOME (Semiahmoo) First Nation, Stz'uminus (Chemainus) First Nation, W̱JOŁEŁP (Tsartlip) First Nation, SȾÁUTW̱ (Tsawout) First Nation, Tsawwassen First Nation, W̱SIḴEM (Tseycum) First Nation, Ts'uubaa-asatx (Lake Cowichan) First Nation; this rich history and cultural heritage continues to this day.

The Coast Salish peoples maintained a vital, thriving, and sustainable connection to their territory and developed rich cultural, spiritual, and traditional ecological knowledge. However, cultural heritage and sacred sites of Salt Spring Island and the greater Islands Trust Area have been and continue to be negatively impacted by European settlement. Past archeological activities, vandalism, and land use have disturbed sites of cultural and spiritual importance. The land and the greater territory remains an embodiment of the stories, oral history, and culture of these First Nations. There are archaeological artifacts dating back thousands of years on Salt

Spring showing a rich history of First Nations. First Nations on Salt Spring Island had permanent village sites, utilizing the lands and waters since time immemorial.

Mr. Cusheon was the first European to settle in the area and he attempted to pre-empt 1000 acres from the government as an industrial center but was successful at receiving only 250 acres (Hatfield 2005). To the south of the Reserve in Cusheon Cove, was the site of Salt Spring Island's first major sawmill and a village was established there by the Bulman Lumber Company in 1905.

The Reserve has been logged repeatedly. There are large high cut stumps in the western portion of the property indicating some selective harvest of easily accessible trees in the late 1800's. Logging and/or fire occurred over much of the property approximately 60 years ago (Ussery 2004).

The original intent for Deep Ridge Nature Reserve was to provide a link in the Salt Spring Island trail network to connect Peter Arnell Park with Ruckle Provincial Park via a route along the shore to the south. However, the extreme steepness of the Reserve makes trail construction unpractical and undesirable. In 2009, the Island Trust Conservancy Board moved to not approve the creation of a hiking trail and stated the current unsanctioned trail should be closed and no further trail building be permitted in the Reserve (Torgrimson 2009). Some of the trails in the Reserve have since been closed and signage has been installed.

The first management plan for the Reserve was written in 1994 and it was revised in November 2004 by Joel Ussery.

Photo 3. "Trail Closed" and "Area Closed" signs along boundary of Deep Ridge Nature Reserve.

2.6 Anthropogenic Features

The previous management plan describes a well head for a drilled well located near the west end of the northern boundary (Ussery 2004). This was not found during 2019 surveys.

There is a well-travelled, unsanctioned trail leading into Deep Ridge Nature Reserve from Peter Arnell Park at the western boundary of the Reserve and the boundary has been signed with a Parks and Recreation Commission (PARC)/Capital Regional District (CRD) boundary sign at both ends. At the western end, the signpost has fallen over although the sign is still there. There are two other infrequently used unsanctioned trails that have been signed at the southern boundary of the Reserve along the border with Peter Arnell Park. At one location, there are three Islands Trust Conservancy (ITC)

signs (Boundary, "Closed Trail" and "Area Closed") and at a second location there are two Islands Trust Conservancy signs ("Closed Trail" and "Area Closed"). There is also an old skid road which now has vegetation growing on it, although compaction is limiting regeneration.

Photo 4. Old skid road with young trees growing on it.

At this time ITC has not undertaken archaeological reviews in cooperation with First Nations to complete Traditional Use Studies (TUS), or a Traditional Ecological Knowledge study (TEK), or worked with Cultural Knowledge Holders (CKH) on the Reserve. ITC will work with First Nations to understand the cultural significance of the area and the ecology.

The Archaeological Branch's archaeological potential modelling indicates there are some small areas with high potential to contain unidentified archaeological deposits on the Reserve.

Table 2. Anthropogenic features in Deep Ridge Nature Reserve.

Anthropogenic Feature	**Description**	**Condition**	**Photopoint Location[5]**
Trail	Well-worn trail in western part of Reserve from Peter Arnell Park	Well-worn unsanctioned trail	P13; Figure 2 467702; 5405644
Boundary signs (3)	PARC/CRD Boundary sign, ITC Closed Trail and Closed Area signs at property line next to unauthorized trail	Regenerating, good cover of native vegetation; Signs in fair condition	P12, P14; Figure 2 468122; 5405622
Boundary signs (2)	ITC Closed Trail and Closed Area signs at property line next to unauthorized trail	Used infrequently, some vegetation re-growth; Signs in fair condition	P3; Figure 2 468695; 5405576
Skid road	Old logging skid road	Fair, regenerating but still compacted	P4, Figure 2 468594; 5405638
Boundary iron pin	Boundary marker along northern boundary of Reserve	Good	No photo 468118; 5405622
Boundary iron pin	Boundary marker along northern boundary of Reserve	Good	No photo 468708; 5405582
Boundary iron pin	Boundary marker on northeastern corner of Reserve	Good	No photo 469270 5405534
Boundary iron pin	Boundary marker on southeastern corner of Reserve	Good	No photo 469273 5405527

[5] Locations of photos are shown on a map in Appendix B with features shown on map in Figure 2.

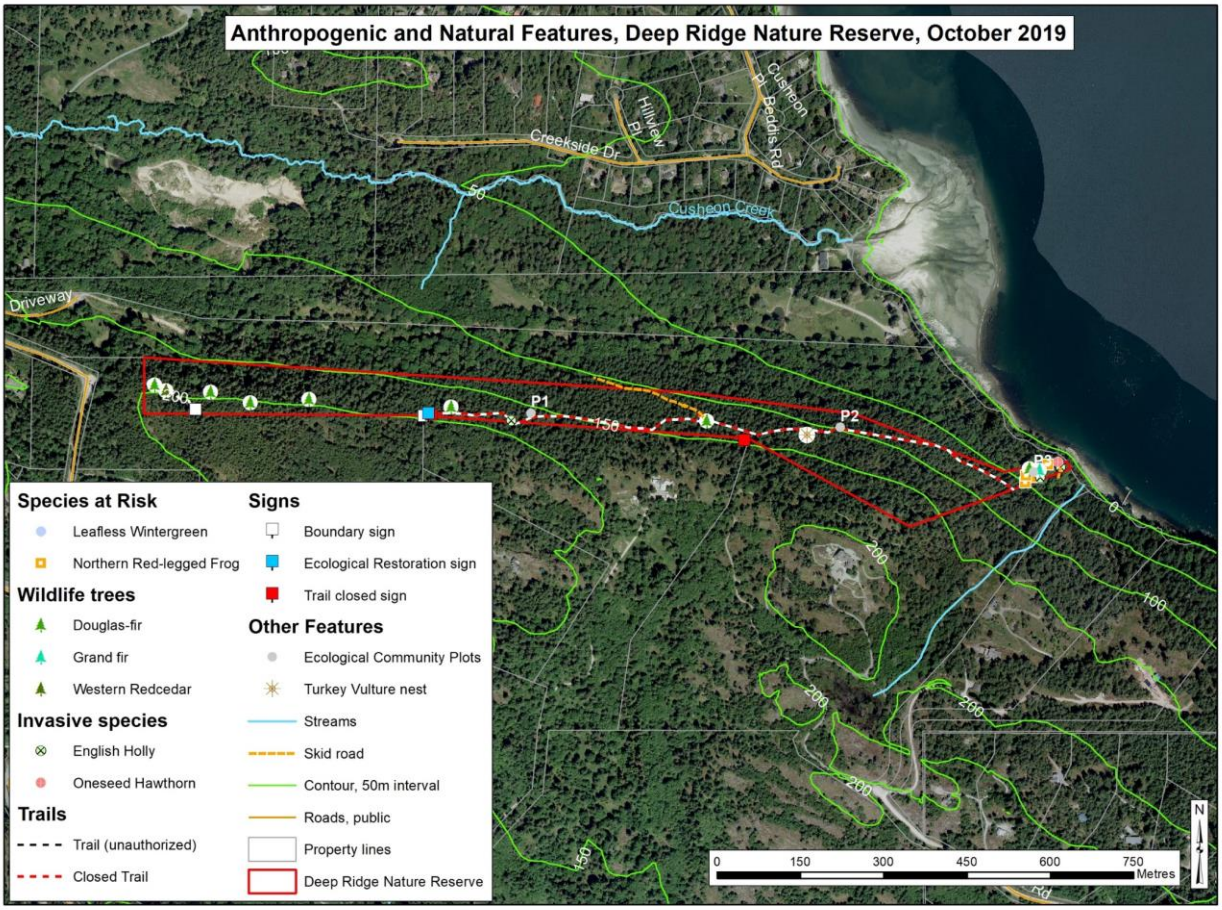

Figure 2. Anthropological and Natural Features in Deep Ridge Nature Reserve.

2.7 Undersurface Rights

Three undersurface rights charges appear on the title search as of October 2019 (200305G, EB3036, EC13825).

2.8 Notations, Charges, Liens and Interests

BC Hydro (EF93078) and BC Telephone Company (EF93079) hold statutory Right of Way over the property.

The Ministry of Transportation and Highways and the Capital Regional District hold a restrictive covenant on the land (EF170381) under Section 215 of *The Land Title Act*, which was executed on December 14, 1992.

The restrictive covenant outlines that the lot will be used as a park conservancy area for recreational or ecological purposes that do not disturb or interfere directly or indirectly with the soil, vegetation and/or fauna or habitat. It includes the following prohibitions:

- No placing of buildings, trailers or mobile structures on the lot
- No generating sewage or disposal use

- No further subdivision
- No cutting, harvesting or removal of trees or foliage except for the purpose of constructing a pedestrian trail network, which shall not include the right to trim, cut or remove for the improvement of the view[6].
- No camping or lighting fires
- No use of motorized vehicles
- No improvements, docks or floats on the foreshore except construction of a staircase to the beach above the highwater mark
- No disturbance or removal of soil, gravel or rock
- No living or dead trees or other plant life to be trimmed, cut down destroyed or moved
- No alteration or interference to the hydrology
- No pollution or contamination including refuse disposal
- No soil, garbage or waste deposited
- No hunting[7] or discharge of firearms
- No keeping of domestic or household animals.

There are no other notations, charges, liens or interests.

2.9 Local Planning Designations

The Reserve is zoned PR6 (Park and Recreation) (Islands Trust 2019c). The primary objective of this designation is to preserve and protect the natural environment of the island's public recreational lands and park land while providing for local and regional recreation needs (Islands Trust 2008).

The Reserve is within Development Permit Area 6 which designates a high soil erosion area and a high slope stability hazard (Islands Trust 2019c). Development Permit Area 3 protects the foreshore and the land portion of the shoreline next to the ocean in the eastern part of the Reserve (Islands Trust 2019c).

2.10 Existing Public and Other Use

Deep Ridge Nature Reserve falls within the territory of multiple First Nations, and as such has been a site of cultural activity and use for thousands of years. There is knowledge and oral history relating to this site that may or may not be shared outside of the membership of a First Nation. As a first step toward strengthening cultural connections to the land that were negatively impacted by European settlement, ITC is exploring the potential of a *Management Plan for Areas of Cultural Heritage and Sacred Significance* that will support and enhance the continued use of the site by First Nations.

[6] Gathering and harvesting under Section 35 of the Constitution Act, 1982 recognizes and affirms the inherent rights of Indigenous Peoples.
[7] Hunting under Section 35 of the Constitution Act, 1982 recognizes and affirms the inherent rights of Indigenous Peoples.

There are no authorized public trails in the Reserve. There is a well-used trail in the western portion of the Reserve that is accessed from Peter Arnell Park and forms a loop between two parts of the park trail (map in Figure 2). There are trails in other parts of the Reserve that do not appear to be used frequently by people and are naturally revegetating.

There are peek-a-boo views of the outer Gulf Islands and the BC mainland from a few locations on the property.

3.0 Inventory by Ecological Community

3.1 Ecological Significance

Deep Ridge Nature Reserve serves as an important green space and provides an important buffer to the regionally-managed Peter Arnell Park. With Peter Arnell Park, the Reserve forms part of a larger protected area comprising 27 hectares (66 acres) of contiguous protected area.

The Deep Ridge Nature Reserve ranges in elevation from 0-200 metres, with the highest elevation in the western part of the Reserve. The Reserve includes steep rocky outcrops and mossy bluffs. The site has been previously logged, leaving behind regenerating young forests in much of the Reserve. There are stumps throughout the Reserve, primarily Douglas-fir, and currently most of the property is forested with dense second or possibly third growth Douglas-fir forests. Over time this forest will develop into a more complex stand and, if left undisturbed over the long term, will likely develop old growth attributes.

The Reserve is within the Coastal Douglas-fir moist maritime (CDFmm) subzone. There are no significant hydrological features and most surface water flows north to Cusheon Creek and east to the ocean.

There is a large number of fallen trees, including some larger trees in the western part of the Reserve. An extreme windstorm in December 2018 caused a large number of trees to fall on Salt Spring Island including some in Deep Ridge Nature Reserve. There are a large number of small diameter dead standing trees in the Reserve, possibly due to increased drought and/or competition since in some areas the trees have not been shaded by the primary canopy and the salal is also experiencing die-back due to drought.

Photo 5. Northern Red-legged Frog in Deep Ridge Nature Reserve.

Two species at risk were recorded in Deep Ridge Nature Reserve: leafless wintergreen and Northern Red-legged Frog. There is high potential

for the blue-listed Ozette coralroot (*Corallorhiza maculata* var. *ozettensis*) to occur since it has been observed in the adjacent Peter Arnell Park and the habitat found in the Reserve is similar to these sites; 2019 surveys were too late to confirm this species. An Olive-sided Flycatcher (*Contopus cooperi*) was heard calling north of the Reserve and may also use the habitat in the Reserve.

A Turkey Vulture (*Cathartes aura*) nest was found under a boulder in the Reserve but few other birds were noted because of the survey time.

Black-tailed Deer (*Odocoileus hemionus*) sign was noted throughout the Reserve and there are deer trails across the slopes throughout the Reserve. High levels of herbivory have limited the diversity of understory species.

Table 3. Species at Risk in Deep Ridge Nature Reserve.

Species Name		Status				
English	Scientific	Provincial	BC List	COSEWIC	SARA	Global
Leafless wintergreen	*Pyrola aphylla*	S3 (2019)	Blue	-	-	GNR
Northern Red-legged Frog	*Rana aurora*	S3 (2016)	Blue	SC (2015)	1-SC (2005)	G4

Table 4. Ecological Communities in Deep Ridge Nature Reserve.

Ecological Community Name		Status		
English	Scientific	Provincial	BC List	Global
Douglas-fir / Dull Oregon-grape	*Pseudotsuga menziesii / Berberis nervosa*	S1 (2018)	Red	G2

Islands Trust Conservancy acknowledges that there is a wealth of traditional ecological knowledge and a long history of ecosystem stewardship among the First Nations whose territory encompasses Deep Ridge Nature Reserve. ITC will strive to work with First Nations knowledge holders to deepen its understanding, improve its stewardship practices, and, ultimately, support the transfer of traditional ecological knowledge to younger generations within First Nations communities to ensure that it is not lost. At this time, the ecological information presented in this management plan was formed using systems that are based in foundations of Western science.

3.2 Climate

The southern Gulf Islands, which includes Salt Spring Island, have a climate pattern of warm, dry summers and mild, wet winters. The maritime influence moderates the effect of elevation, latitude, and aspect on local temperature and precipitation.

The weather statistics for the Cusheon Lake station (the closest station to the Deep Ridge Nature Reserve) show the annual precipitation is approximately 1071 millimetres and most of it comes in the form of rain rather than snow (Environment Canada 2019). On Salt Spring Island, average daily temperatures peak in the summer months (July and August) at 16°C and are lowest in the winter (December and January) at 2.4-2.8°C (Figure 3). The reverse is true for

precipitation, with the winter months from November to January having the highest rainfall (averaging 139-185 millimetres) and July and August being the driest months (24-26 millimetres) (Environment Canada 2019).

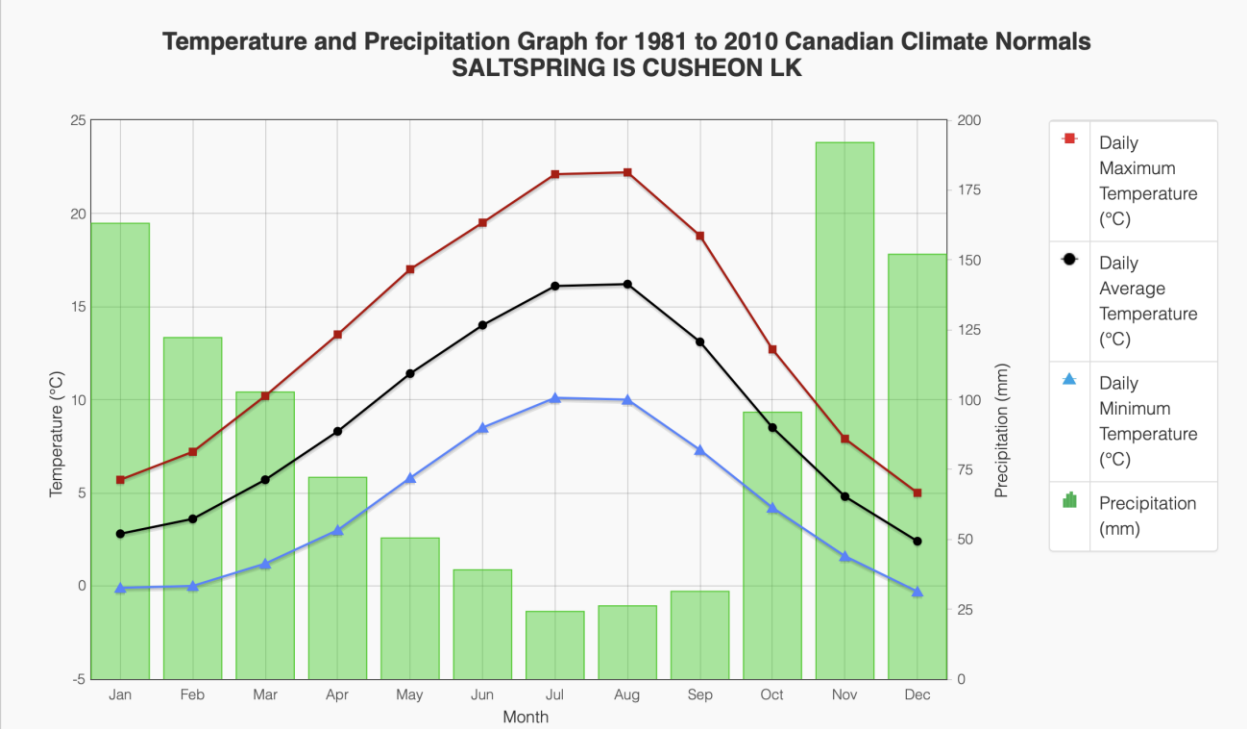

Figure 3. Canadian climate normals for temperature and precipitation at Cusheon Lake weather station, British Columbia from 1981-2018 (Environment Canada 2019).

The future impacts from climate change are unknown, although a summer drying trend and an increase in storm events are predicted (Mauger et.al. 2015). More powerful storm surges and sea level rise may cause increasing erosion along the shoreline and may cause a loss of coastal habitats (Islands Trust 2019a). Sea level rise and related impacts may lead to a loss of cultural and historical sites on coastlines (Islands Trust 2019a).

Forests may see a shift in the distribution and range of species (Islands Trust 2019a). Climate change may be associated with an increased risk of pest outbreaks, forest fire risk and competition from invasive species (Islands Trust 2019a). Higher temperatures and less precipitation may lead to localized stress on trees and plants. Maintaining habitat connectivity, biodiversity and ecosystem resilience may assist the flora and fauna adapting to climate change stresses.

3.3 Geology and Physiology

The Reserve is a long narrow property that follows the upper portion of an east-west ridge with a northern aspect. Elevation ranges from about 200 metres above sea level (asl) in the western part of the property to 100 metres asl before dropping steeply to the shoreline. Slopes in the

western portion of the property range from 30-45% and over the rest of the property range from 70-100%.

Steep slopes, loose surface rock and poorly developed soils reduce the range of uses the property is able to support and makes trail construction and maintenance difficult. Soil erosion potential is high due to steep slopes.

3.4 Hydrology

Most of the Reserve is upper slope and moisture shedding. Water flows downslope to the Cusheon Creek valley to the north and east to the ocean. There are no streams on the property although the previous landholder mentioned a spring on the property (Ussery 2004), which was not observed during 2019 surveys. Surface and subsurface runoff collects in hollows and seepage areas at the base of rock faces. Groundwater recharge may occur though faults and contact zones between rock types in underlying bedrock.

3.5 Soils

The Deep Ridge Nature Reserve is underlain by sedimentary rock dating from 80 million years before present (van Vliet et al. 1987). Exposed bedrock is common in the hummocky upland terrain. The adjacent valley has eroded from less resistant mudstones and shales, likely along a fault line (van Vliet et al. 1987).

Beddis soil on the westernmost portion of the property developed on deep (>150 centimetre) marine, water or windborne deposits of loamy sand to sandy loam (van Vliet et al. 1987). The soil type is well to rapidly drained with a very low (0-10%) coarse fragment content. Beddis soils remain moist during winter months but quickly dry in the summer (van Vliet et al. 1987).

The majority of the property is underlain by Rumsley soils (van Vliet et al. 1987). This soil type has developed on shallow (<100 centimetre) fallen rock or glacial deposits over bedrock. These sandy loam to loamy sand soils are well drained with a coarse fragment content of 20-50%. Although these soils are dry in summer, they are subject to subsurface water flows when saturated (van Vliet et al. 1987). Rumsley soils in the eastern portion of the property may be only 50 centimetres deep.

3.6 Ecological Classifications

The Deep Ridge Nature Reserve occurs within the Coastal Douglas-fir moist maritime (CDFmm) biogeoclimatic zone (Green and Klinka 1994). Climatic factors, in conjunction with existing soil conditions, result in a forest with a long growing season, although water deficits may occur on zonal sites (Green and Klinka 1994). The Reserve is within the Pacific Maritime Ecozone and the Georgia-Puget Basin Ecoregion (Ecological Framework of Canada 2019).

3.7 Ecological Communities and Site Series

The previous management plans for Deep Ridge Nature Reserve did not delineate ecological communities. Terrestrial Ecosystem Mapping (TEM) identified 4 units although 3 of these units included only very small portions of the Reserve (iMap 2019). The entire Reserve was

considered to be one ecological community, but three plots were done to capture the range of variation within this community in the Reserve. The ecological descriptions were collected on July 31st, 2019.

Site series were identified using *A Field Guide for Site Identification and Interpretation for the Vancouver Forest Region* (Green and Klinka 1994). Structural stage was as defined in *Standards for Terrestrial Ecosystems Mapping in British Columbia* (RIC 1998).

A list of all plant species is included in Appendix A. Locations where photographs were taken and a map showing photo points are included in Appendix B.

Photo 6. Larger diameter blowdown next to unauthorized trail in Deep Ridge Nature Reserve.

The forests in Deep Ridge Nature Reserve are dominated by Douglas-fir although Western Hemlock (*Tsuga heterophylla*) is present in smaller numbers. Arbutus[8] (*Arbutus menziesii*) are present in shallower soils and around broken rock throughout the property. Bigleaf maple (*Acer macrophyllum*), western redcedar[9] (*Thuja plicata*), and Red Alder (*Alnus rubra*) are present in moister areas. There are several moss and lichen-covered bedrock outcrops in the property. Garry oak (*Quercus garryana*) and Bitter Cherry (*Prunus emarginata*) were also noted in higher elevations.

Most of the forest is densely stocked with young (approximately 30-60 year old) trees and there is little understory shrub and herbaceous growth. There are large numbers of small diameter standing dead trees (snags) and large amounts of small diameter woody debris on the forest floor, with some larger blowdown from recent windstorms. There are fire scars on the older stumps and some large diameter wildlife trees.

[8] Culturally significant species
[9] Culturally significant species

Ecological Community 1. Douglas-fir / Dull Oregon-grape - Plot 1

Ecological Community 1 is the dominant vegetation type throughout the Reserve. Three plots were done in this community to capture the full range of variation in this community throughout the Reserve. The community is a young second or third growth forest dominated by Douglas-fir trees. The age of the largest trees was estimated to be between 30-60 years old, so the age class is young forest although many of the trees are pole/sapling sized. There is a large number of dead, small diameter Douglas-fir trees that have died from competition and/or recent drought conditions. There is a large amount of small diameter coarse woody debris on the forest floor and many Douglas-fir stumps. The site is dry with well-drained, shallow soils.

In plot 1, the land slopes at approximately 60% to the northeast (20°). There is abundant scattered, loose surface rock.

Photo 7. Vegetation in Ecological Community 1, Plot 1, showing dense young Douglas-fir forest.

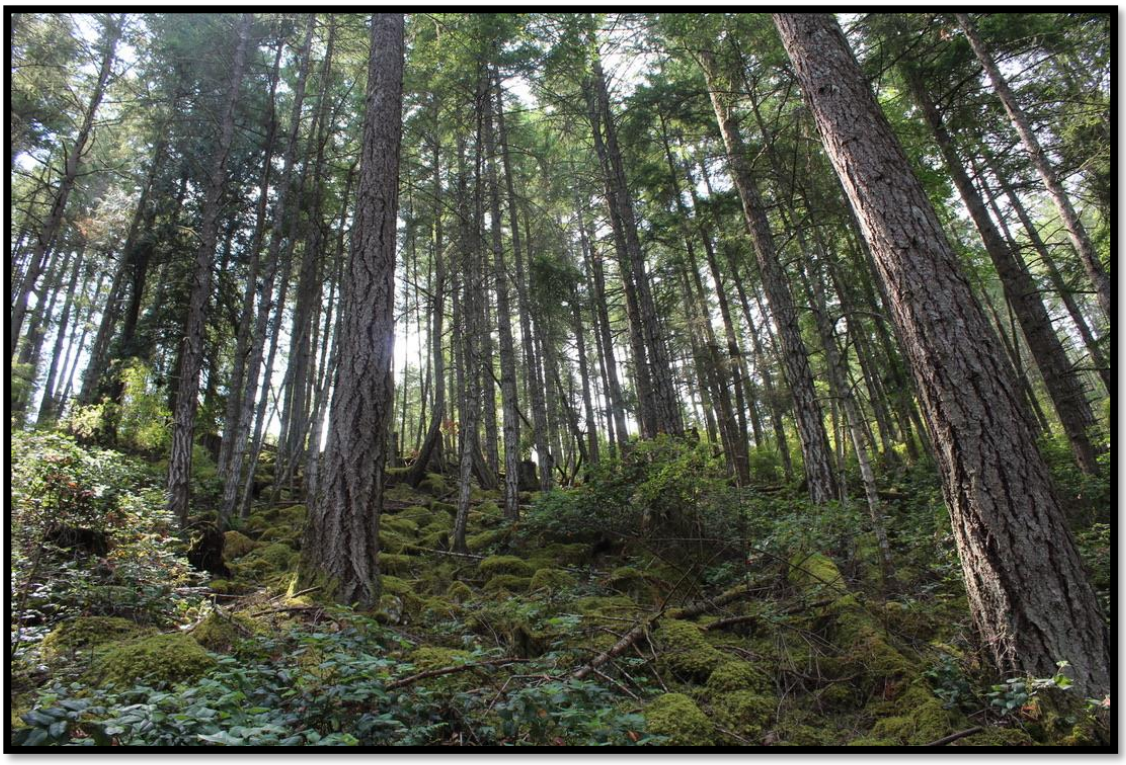

Photo 8. Vegetation in Ecological Community 1, Plot 1, showing abundant surface rock and steep slopes.

Table 5. Description of Ecological Community 1- Plot 1.

Polygon ID:	Ecological Community 1
Ecological Community:	Douglas-fir / Dull Oregon-grape
Classification:	CDFmm01
Structural Stage:	Young forest
Status (BC List):	Red-list
Photopoint(s):	PP1
Ecological Community Description:	Dry, second growth Douglas-fir forest on upper slope. Poor to medium soil nutrient regime and well drained with abundant loose surface rock.
Disturbance Notes:	Previously logged as evidenced by many stumps. Fires and drought may influence vegetation patterns over time.
Anticipated Change/Succession:	Forest will mature and diversify over time. As the forest matures, canopy gaps will create tree regeneration sites.
Wildlife observations:	Heard in plot: Common Raven (*Corvus corax*) and Chestnut-backed Chickadee (*Poecile rufescens*). Heard outside of Plot: Northern Pacific Treefrog (*Pseudacris regilla*); Olive-sided Flycatcher (*Contopus cooperi*) calling approximately 200 m north (downslope).

Table 6. Vegetation Species in Ecological Community 1- Plot 1.

VEGETATION SPECIES	PERCENT COVER (%)						NOTES
	Main Canopy	Secondary	Shrub Layer	Herb Layer	Moss, Lichen Layer	Non-natives	
Pseudotsuga menziesii (Douglas-fir)	35	10					MC: 30-60 yrs, ht: 25-30 m, DBH: 37-68 cm SC: 15-20 yrs, ht: 5-15 m, DBH: 10-25 cm
Thuja plicata (western redcedar)		2					SC: 20 yrs, ht: 8 m, DBH: 20 cm
Arbutus menziesii (arbutus)		<1					SC: 15 yrs, ht: 5 m, DBH: 11 cm
Gaultheria shallon (salal)			42				
Holodiscus discolor (oceanspray)			5				
Berberis nervosa (dull Oregon-grape)			2				
Rosa gymnocarpa (baldhip rose)			1				
Lonicera ciliosa (western trumpet)			<1				
Vaccinium parvifolium (red huckleberry)			<1				
Polystichum munitum (sword fern)				1			
Bromus vulgaris (Columbia brome)				<1			
Festuca occidentalis (western fescue)				<1			
Lysimachia latifolia (broad-leaved starflower)				<1			
Melica subulata (Alaska oniongrass)				<1			
Russula xerampelina (shrimp russula) mushroom				<1			
Moss Layer							**Total Moss Layer: 50%**
Hylocomium splendens (step moss)					41		
Rhytidiadelphus loreus (lanky moss)					5		
Eurynchium oreganum (Oregon-beaked moss)					2		
Rhytidiadelphus triquetrus (electrified cat's-tail moss)					2		
Dicranum sp. (broom moss)					<1		
Cover by Layer (%)	**35**	**12**	**50**	**1**	**50**		**Total Canopy Cover: 47%**

Ecological Community 1. Douglas-fir / Dull Oregon-grape - Plot 2

The second plot in Ecological Community 1 is on a very steep slope (100%) with a northern aspect (6°). The site has shallow, rapidly draining soils. There are a large number of loose surface rocks and many young, dead, standing Douglas-fir trees.

Table 7. Description of Ecological Community 1- Plot 2.

Polygon ID:	Ecological Community 1
Ecological Community:	Douglas-fir / Dull Oregon-grape
Classification:	CDFmm01
Structural Stage:	Young forest
Status (BC List):	Red-list
Photopoint(s):	PP2
Ecological Community Description:	Dry, second growth Douglas-fir forest on upper slope. Poor to medium soil nutrient regime and well-drained with abundant, loose, surface rock.
Disturbance Notes:	Previously logged as evidenced by many stumps. Fire scars on stumps indicate past fire. Drought may influence vegetation patterns over time.
Anticipated Change/Succession:	Forest will mature and diversify over time. As the forest matures, canopy gaps will create tree regeneration sites.
Wildlife observations:	Many Black-tailed Deer (*Odocoileus hemionus*) trails through area. Heard: American Robin (*Turdus migratorius*), Chestnut-backed Chickadee (*Poecile rufescens*) and Red-breasted Nuthatch (*Sitta canadensis*).

Table 8. Vegetation Species in Ecological Community 1- Plot 2.

VEGETATION SPECIES	PERCENT COVER (%)						NOTES
	Main Canopy	Secondary	Shrub Layer	Herb Layer	Moss, Lichen Layer	Non-natives	
Pseudotsuga menziesii (Douglas-fir)	40						MC: 40-80 yrs, ht: 12-30 m, DBH: 45-60 cm
Thuja plicata (western redcedar)		2					SC: 30 yrs, ht: 12 m, DBH: 30 cm
Tsuga heterophylla (western hemlock)		2					SC: 15 yrs, ht: 4 m, DBH: 15 cm
Arbutus menziesii (arbutus)		1					SC: 30 yrs, ht: 10 m, DBH: 30 cm
Gaultheria shallon (salal)			5				
Holodiscus discolor (oceanspray)			5				
Berberis nervosa (dull Oregon-grape)			2				
Lonicera ciliosa (western trumpet)			<1				
Lonicera hispidula (hairy honeysuckle)			<1				
Vaccinium parvifolium (red huckleberry)			<1				
Polystichum munitum (sword fern)				1			
Acer macrophyllum (bigleaf maple)				<1			
Amelanchier alnifolia (saskatoon)				<1			
Bromus vulgaris (Columbia brome)				<1			
Festuca occidentalis (western fescue)				<1			
Melica subulata (Alaska oniongrass)				<1			
Moehringia macrophylla (large-leaved sandwort)				<1			
Polypodium glycyrrhiza (licorice fern)				<1			
Pseudotsuga menziesii (Douglas-fir)				<1			
Moss Layer							**Total Moss Layer: 75%**
Hylocomium splendens (step moss)					71		
Eurynchium oreganum (Oregon-beaked moss)					2		
Rhytidiadelphus triquetrus (electrified cat's-tail moss)					2		
Dicranum sp. (broom moss)					<1		
Rhytidiadelphus loreus (lanky moss)					<1		
Cover by Layer (%)	**40**	**5**	**12**	**1**	**75**		**Total Canopy Cover: 45%**

Ecological Community 1. Douglas-fir / Dull Oregon-grape - Plot 3

Plot 3 is in a moisture-receiving site at the mouth of a small drainage system. The area is at a low elevation and there is marine influence from the ocean. The community is below a steep slope and has an aspect of 38° with a slope of 25%. The soils are shallow and there is a large amount of leaf litter from bigleaf maple.

There are some larger diameter trees and there is a large amount of blowdown, likely from the December 2018 windstorm. There are several wildlife trees including a large grand fir tree. There are stumps showing evidence of former logging.

Photo 10. Larger diameter trees on level site close to the ocean in Plot 3, Ecological Community 1.

Table 9. Description of Ecological Community 1- Plot 3.

Polygon ID:	Ecological Community 1
Ecological Community:	Douglas-fir / Dull Oregon-grape
Classification:	CDFmm01
Structural Stage:	Young forest
Status (BC List):	Red-list
Photopoint(s):	PP3
Ecological Community Description:	Moisture-receiving site in dry second-growth Douglas-fir forest on lower slope. Medium soil nutrient regime and well-drained towards the ocean.
Disturbance Notes:	Previously logged as evidenced by stumps. Drought may influence vegetation patterns over time.
Anticipated Change/Succession:	Forest will mature and diversify over time. As the forest matures, canopy gaps will create tree regeneration sites.
Wildlife observations:	Evidence of Black-tailed Deer (*Odocoileus hemionus*) browse. Heard: Chestnut-backed Chickadee (*Poecile rufescens*). Observed: Northern Red-legged Frog (*Rana aurora*) just outside of plot.

Table 10. Vegetation Species in Ecological Community 1- Plot 3.

VEGETATION SPECIES	PERCENT COVER (%)						NOTES
	Main Canopy	Secondary Canopy+	Shrub Layer	Herb Layer	Moss, Lichen Layer	Non-natives	
Pseudotsuga menziesii (Douglas-fir)	30						MC: 40-60 yrs, ht: 25-30 m, DBH: 35-65 cm
Abies grandis (grand fir)	2						MC: 60 yrs, ht: 30 m, DBH 50 cm SC: 12 yrs, ht: 4 m, DBH: 6cm
Acer macrophyllum (bigleaf maple)		30					SC: 25-50 yrs, ht: 3-10 m, DBH: 30-60 cm
Thuja plicata (western redcedar)		2					SC: 10-20 yrs, ht: 3-7 m, DBH: 5-15cm
Tsuga heterophylla (western hemlock)		1					SC: 15 yrs, ht: 4 m, DBH: 11 cm
Berberis nervosa (dull Oregon-grape)			1				
Gaultheria shallon (salal)			1				
Vaccinium parvifolium (red huckleberry)			<1				
Polystichum munitum (sword fern)				30			
Achlys triphylla (vanilla leaf)				1			
Galium aparine (cleavers)				<1			
Lysimachia latifolia (broad-leaved starflower)				<1			
Polypodium glycyrrhiza (licorice fern)				<1			
Ilex aquifolium (English holly)						<1	
Mycelis muralis (wall lettuce)						<1	
Moss Layer							**Total Moss Layer: 19%**
Eurynchium oreganum (Oregon-beaked moss)					15		
Rhytidiadelphus triquetrus (electrified cat's-tail moss)					2		
Hylocomium splendens (step moss)					2		
Rhytidiadelphus loreus (lanky moss)					<1		
Cover by Layer (%)	**32**	**33**	**2**	**30**	**19**	**<1**	**Total Canopy Cover: 65%**

3.8 Wildlife Species

The dense forest, steep slopes, and low habitat variability supports limited wildlife. However, standing wildlife trees provide perches for birds of prey, foraging habitat for woodpeckers, nesting habitat for cavity nesting birds and loose bark for bat roosting sites. There are a large number of small-diameter (<20 centimetre) DBH wildlife trees throughout the Reserve. Downed wood provides habitat for amphibians including frogs and salamanders. Black-tailed Deer scat was noted throughout the Reserve and there are deer trails throughout. A list of wildlife species observed in the Reserve during 2019 field work is included in Table 11.

Photo 11. Mix of Douglas-fir and western redcedar young standing dead wildlife trees in Deep Ridge Nature Reserve.

Photo 12. Turkey Vulture nest used earlier in the summer of 2019 as evidenced by downy feathers near entrance.

The Reserve likely provides habitat for a wide range of birds, but the field surveys were not done at an ideal time for assessing bird activity. A Turkey Vulture nest was found in the Reserve under a boulder overhang (map in Figure 2). A vulture, possibly a fledged juvenile, took off from beside the boulder when approached and there were a large number of downy feathers and guano present. No eggshells were found in the nest. A raptor nest has been mapped on the property south of the Reserve along the shoreline but this was not observed during 2019 surveys (Islands Trust 2019c).

Few gastropods were found due to the extremely dry conditions during the survey.

Table 11. Wildlife Species Observed in Deep Ridge Nature Reserve.

Common Name	Latin Name	Observation Type
Mammals		
Black-tailed Deer	*Odocoileus hemionus*	Scat and browse observed
Red Squirrel	*Tamiasciurus hudsonicus*	Visual observation, caches observed, calls heard
Invertebrates		
Lancetooth	*Ancotrema* sp.	Visual observation
Pacific Bananaslug	*Ariolimax columbianus*	Visual observation
Robust Lancetooth	*Haplotrema vancouverense*	Visual observation
Amphibians		
Northern Pacific Treefrog	*Pseudacris regilla*	Heard calling
Northern Red-legged Frog	*Rana aurora*	Visual observation
Birds		
American Robin	*Turdus migratorius*	Heard
Bald Eagle	*Haliaeetus leucocephalus*	Observed flying over Reserve
Brown Creeper	*Certhia americana*	Heard and visual observation
Cassin's Vireo	*Vireo cassinii*	Heard
Chestnut-backed Chickadee	*Poecile rufescens*	Heard and visual observation
Common Raven	*Corvus corax*	Heard and visual observation
Downy Woodpecker	*Dryobates pubescens*	Heard and visual observation
Olive-sided Flycatcher	*Contopus cooperi*	Heard north of Reserve
Pacific-slope Flycatcher	*Empidonax difficilis*	Heard
Pileated Woodpecker	*Dryocopus pileatus*	Cavities noted in trees
Red-breasted Nuthatch	*Sitta canadensis*	Heard
Spotted Towhee	*Pipilo maculatus*	Heard
Turkey Vulture	*Cathartes aura*	Observed flying over Reserve and flying up from nest site

3.9 Expected Change Over Time

The upland forests will continue to mature and diversify over time. In areas with dense young conifers, self-thinning will occur, providing more light for understory plants to grow. There will be slow development of old forest characteristics as trees mature and gaps are created through natural mortality and wind. In areas with dense growth, there will be self-thinning due to density-related mortality.

4.0 Threats

Table 12. Threats to Natural Values in Deep Ridge Nature Reserve.

Threats (examples below)	Forest	Shoreline	Overall Threat Rank
Recreational Activities: Hiking can impact conservation targets through wildlife disturbance, soil disturbance, vegetation trampling, habitat fragmentation, and erosion. This threat is expected to increase in severity over time with increasing numbers of residents and seasonal visitors to Salt Spring. There are no official hiking trails in the Reserve; however, there is a well-established unauthorized trail in the western part of the Reserve. Trail design and construction is not recommended due to the loose substrate, large number of dead/downed trees and steep terrain.	Medium	Low	Medium
Fire (Catastrophic Wildfire): Fire suppression results in a change of fire regime to lower-frequency and higher-intensity fires. Higher-intensity fires are also generally larger in size. A less frequent, more intense fire could potentially replace the forests. Vegetation recovery post-catastrophic fire is slow and invasive terrestrial species are likely to invade into areas with bare soil. Because of the dense forest stands in the Reserve and high abundance of ladder fuels, the impact from a wildfire is likely to be high.	Medium-High	Low	Medium-High
Invasive Non-Native Species: Invasive non-native species are a significant threat to biodiversity, second only to habitat loss (IUCN 2018). The impact on native ecosystems, habitats and species can be severe and often irreversible. Except for a few small English holly (*Ilex aquifolium*) plants in the forested area, the Reserve currently has few invasive shrubs.	Low	Low	Low
Problematic Native Species: Hyper-abundant Black-tailed Deer (*Odocoileus hemionus*) can be problematic, limiting natural regeneration, dramatically altering understory vegetation structure and composition, and adversely affecting songbird populations (Martin et al. 2011). The dense forest canopy limits understory growth so the Reserve likely supports low numbers of deer.	Low	N/A	Low
Windthrow and Falling Trees: The high density of trees has led to natural mortality and thinning resulting in a large number of small diameter dead and dying standing trees. Because the property is very narrow, disturbances such as logging on adjacent properties will increase the risk of windthrow. The windstorm in December 2018 resulted in some fallen trees.	Medium	N/A	Medium

Shoreline Erosion: The shoreline is steeply sloping and erosion is occurring. Erosion may become more extreme with increasing storm surge associated with climatic events. There is also erosion occurring on the steep slopes above the shoreline.	N/A	Medium	Medium
Climate Changes: Over time, the trend towards longer, drier summers and droughts in the region may impact the survival of tree seedlings and even established species such as western redcedar that prefer wetter soils.	Unknown	Unknown	Unknown
Overall Threat Status for Protected Area	**Medium**	**Low**	**Medium**

4.1 Expected Change to Threats over Time

Recreational activities and unauthorized human disturbance and infractions into the Reserve are likely to increase over time given the increased development pressure on Salt Spring Island and the increase in seasonal visitors.

The threat of catastrophic high-intensity wildfire remains high in the region as climate appears to be shifting to increasingly drier summers and fire suppression remains active in the region.

If left untreated, English holly may spread into other parts of the Reserve.

5.0 Community Engagement

5.1 Adjacent Landholders

In preparation for the development of the Management Plan, letters were sent to all landholders and neighbours within a 100 metre radius of the Reserve. A total of 9 letters were mailed on November 29, 2019 (Appendix C). The letters contained information about Deep Ridge Nature Reserve, an invitation to a public display, and a questionnaire (see Appendix D).

5.2 First Nations

Letters were mailed to the following First Nations on December 2, 2020 (Appendix E):

- Cowichan Tribes, Halalt First Nation, Lyackson First Nation, MÁLEXEŁ (Malahat) Nation, BOḰEĆEN (Pauquachin) First Nation, Penelakut Tribe, SEMYOME (Semiahmoo) First Nation, Stz'uminus (Chemainus) First Nation, W̱JOŁEŁP (Tsartlip) First Nation, ST̓ÁUTW̱ (Tsawout) First Nation, Tsawwassen First Nation, W̱SIḴEM (Tseycum) First Nation, Ts'uubaa-asatx (Lake Cowichan) First Nation

This letter provided information about the Nature Reserve and outlined the proposed management plan. It also outlined the commitment to develop a parallel *Management Plan for Areas of Cultural Heritage and Sacred Significance*. This parallel Management Plan sets out guiding principles for cooperative collaboration between ITC and First Nations.

5.3 Conservation Partners and Community Members

The Islands Trust Conservancy was present at the Saturday market at Centennial Park, December 14th, 2019 from 10:30am to 12:30pm. People attending the market were asked to

provide input on the draft management plan and general management planning for the Reserve. Maps and photographs were presented, and residents were asked for their input at that time.

An online questionnaire was also made available from November 29, 2019 – January 20, 2020.

5.4 Engagement Results

The questionnaire was completed by 12 people. All respondents were full-time Salt Spring Island residents, with 58% living on the northern Salt Spring and 33% living on the mid-island. Many respondents (42%) have visited the Reserve a few times, some (25%) have visited the Reserve a few times per year, one (8%) had been to the Reserve once, and some (25%) had never visited the reserve. All who have visited the Reserve engaged in hiking/walking (100%) and many engaged in wildlife viewing (44%) or dog walking (11%). The most important values for respondents were protection of habitat for at-risk species (83%), conservation for the sake of the intrinsic value of nature (75%), and ecosystem services (58%). Recreational opportunities (42%), educational and research opportunities (42%), aesthetic appeal (25%) and wildlife protection (8%) were also noted as important values by respondents.

6.0 Management Recommendations

The general management direction of the Deep Ridge Nature Reserve is to allow natural successional processes. With the exception of fire, natural disturbance factors due to wind (windthrow), pest infestation, disease, and wildlife use should proceed without intervention. Only the removal of invasive plant species is permitted. Trails will not be developed because it is impossible to create trails that are safe for the public and do not disturb the habitat. Public use will not be encouraged in order to limit fragmentation and disturbance. The terrain in the Reserve makes it impossible to create safe trails that will not jeopardize public safety and the Island Trust Conservancy Board moved to not approve the creation of hiking trails in the Reserve.

6.1 Management Roles

The Islands Trust Conservancy is the sole landholder of the Deep Ridge Nature Reserve and there are currently no other management partners. The Islands Trust Conservancy will monitor the property annually to detect any management issues.

6.2 Permitted and Prohibited Uses

There are no authorized trails in the Reserve due to the steep terrain and public access is not encouraged.

The following activities by the public are prohibited:

- Hunting[10]
- Use of motorized vehicles

[10] Hunting under Section 35 of the Constitution Act, 1982 recognizes and affirms the inherent rights of Indigenous Peoples.

- Bicycling
- Horseback riding
- Camping
- Fires
- Forestry
- Livestock grazing
- Trail development
- Tree cutting
- Collection of plants, animals or fungi[11]

6.3 Proposed Monitoring Program

Annual covenant monitoring is important to ensure that there are no infractions or management issues occurring within the protected area. The focus of covenant monitoring should be along the boundaries of the Reserve where the Reserve abuts private property and the regionally-managed park. Monitoring should determine if any prohibited uses are occurring, such as tree cutting or unauthorized trail development. The proposed monitoring route should follow the boundary of the park on both the northern and southern edges of the property except in the eastern portion of the Reserve where it is not possible to follow the property line due to the steep terrain.

Species at risk surveys and monitoring are encouraged during appropriate times of year to assess which species are present in the Reserve. Removal and monitoring of invasive species spread is advised.

6.4 Public Access

There are no authorized public trails in the Reserve, although several unauthorized, closed trails exist in the Reserve. Access for Islands Trust Conservancy monitoring and maintenance is through Peter Arnell Park (see Section 2.3 for additional details).

6.5 Signage

There are three Islands Trust Fund signs next to an infrequently used trail near the middle of the Reserve. The signs indicate the boundary of the Nature Reserve, that the area is closed and that the trail is closed. There are two signs in another location indicating that the area is closed and the trail is closed.

[11] Harvesting and gathering under Section 35 of the Constitution Act, 1982 recognizes and affirms the inherent rights of Indigenous Peoples.

There is a Parks and Recreation Commission (PARC)/Capital Regional District (CRD) sign at the western boundary of the Reserve next to the main access trail from Peter Arnell Park but the post has fallen over. There is a sign at the eastern part of this trail where it crosses into Peter Arnell Park to the south. See map in Figure 2 for locations of signs.

Photo 13. Three Islands Trust Fund signs indicating the boundary and the closed trail.

It is recommended that an Islands Trust Conservancy sign be installed at the western boundary of the park on the same post as the PARC sign and that the post be replaced. It is also recommended that the multiple signs next to the infrequently used trails be removed and replaced with two Islands Trust Conservancy boundary sign indicating there is no access. When signs are updated, it is recommended that general contact information for the Islands Trust Conservancy be included.

Photo 14. Well-worn trail and boundary sign less than 100 m east of Peter Arnell Parking lot.

As part of reconciliation ITC may discuss signage and naming with First Nations.

6.6 Trail Use, Maintenance and Development

There are no authorized trails in the Reserve. There is a well-worn unauthorized trail that starts at the western boundary of the Reserve less than 100 metres from the Peter Arnell Parking lot (refer to map in Figure 2). The trail branches off a mapped trail in Peter Arnell Park and rejoins the main park trail further to the east. This trail is used regularly and fallen trees have been regularly cleared over the years. Although the trail is signed as being outside of PARC/CRD boundaries, there is no indication that hikers are entering an Islands Trust Conservancy Nature Reserve. It is recommended that this trail be closed and restored.

Photo 15. Trail closed sign showing regrowth of vegetation over trail.

There are additional infrequently used trails to the east (refer to map in Figure 2). There are signs indicating the trails are closed; they appear to receive little use and vegetation has grown over the former trail beds.

Development of trails is not recommended is to ensure public safety and avoid habitat fragmentation and degradation.

Photo 16. Seed capsules of leafless wintergreen in Deep Ridge Nature Reserve.

6.7 Protection Initiatives for Sensitive Ecosystems and Species and Ecosystems at Risk

Trails should not be developed in the Reserve to avoid impacts or degradation and erosion to sensitive habitats and steep terrain.

6.8 Ecological Restoration Options

To date, there have been no ecological restoration activities in Deep Ridge Nature Reserve. It is recommended that the unauthorized trail at the western boundary be decommissioned and restored. Restoration efforts should include installing signage at both ends of the trail and placing large amounts of woody debris on the trail bed to discourage use. Further restoration could include installing split rail fencing, as well as planting and fencing native trees and shrubs in the disturbed areas. Planted trees should be monitored annually and cages removed once

the trees have grown to a suitable size to be able to withstand some browsing by deer. Species chosen for restoration planting should be chosen from those currently found within the Reserve (Appendix A).

6.9 Scientific Research/Education Opportunities

No research has been conducted to date in the Reserve. Possible future research could include species at risk surveys and monitoring during peak season for a variety of species, such as rare plants, mosses and lichens, bats, birds, gastropods, and amphibians.

Leafless wintergreen seed capsules were observed during 2019 surveys in preparation for this management plan. Further surveys earlier in the season would likely find more occurrences of this and other rare species, including possibly Ozette coralroot, which is found in the adjacent Peter Arnell Park.

Photo 17. Small English holly plant in Deep Ridge Nature Reserve.

6.10 Exotic and Invasive Species Management

The Reserve is notable for its near lack of exotic and invasive species. A few small English holly (*Ilex aquifolium*) plants were noted and they should be removed as soon as possible before they become well-established and spread to other areas of the Reserve. There is a single Oneseed hawthorn (*Crateagus monogyna*) on an old skid road close to the ocean.

6.11 Wildfire Risk Management

Wildfire and wildfire suppression can be extremely damaging to sensitive ecosystems. Developing a fire management plan in consultation with the Salt Spring Island Fire Department and BC Wildfire Service to identify optimum fire suppression techniques is recommended. This information should be provided to the province to be included in their annual fire plan. If possible, it is preferred that saltwater or fire retardants are not used for fire suppression since both can cause ecological damage to sensitive ecosystems. Cusheon Lake is a nearby source of freshwater on Salt Spring that should be used for bucketing in case of a wildfire.

6.12 Climate Change Impacts and Management

The Coastal Douglas-fir biogeoclimatic zone is highly sensitive to climate change (Hebda 1997). Climate change may impact the distribution of ecosystems across the landscape, affecting vegetation patterns, hydrology, and outbreaks of pests (Islands Trust 2019a). Trends that may prevail across British Columbia and the Yukon include upslope migration of tree lines and ecosystem boundaries, and increased fire frequency (Hebda 1997). In the CDFmm, warm dry conditions will favour the replacement of forests by woodland or meadow/knoll characteristics

and warm and mesic conditions may lead to the development of Garry oak woodlands and forests (Hebda 1997). Western redcedar is already experiencing dieback in many areas of Salt Spring, presumably due to drought conditions associated with climate change.

Ensuring ongoing protection and connectivity between large areas of protected ecosystems will aid the dispersal of species into new habitats and across elevations as vegetation patterns shift. These protected area matrices will provide potential reservoirs for dispersal into suitable habitats in adjacent areas as climate change shifts the distribution of these ecosystem types (McCloskey et al. 2009).

7.0 Action Items

7.1 Immediate Actions (1-2 years)

1. Support all partners, contractors and volunteers to complete cultural competency training in regard to reconciliation, knowledge and history of Coast Salish and Indigenous Peoples.
2. Engage with First Nations to ensure that the management plan is reflective of treaty, inherent rights, and the territories of each Nation.
3. Work in collaboration towards a Management Plan for Areas of Cultural Heritage, gathering and harvesting, and Sacred Significance with First Nations.
4. Continue to work with the Parks and Recreation Commission (PARC) to discourage the use of trails in the Reserve.
5. Install a new post and signage at the western boundary of the Reserve next to the well-used unauthorized trail close to the parking lot.
6. Install Islands Trust Conservancy boundary signage at access points from Peter Arnell Park to identify the area as a Nature Reserve and outline prohibited uses.
7. Remove multiple signs at closed trail locations and replace with a single boundary sign with Islands Trust Conservancy contact information indicating public access is not allowed.
8. Remove isolated non-native English holly from the Reserve before it becomes established.

7.2 Short term Actions (3-5 years)

1. Prepare a wildfire management plan that considers both forest ecology and prevention of damage to surrounding neighbourhoods in consultation with the local fire authorities.
2. Develop and implement a trail decommissioning and restoration plan for the unofficial trail at the western boundary of the Reserve.

7.3 Long term Actions (5+ years)

1. Conduct surveys for species at risk and other wildlife (e.g. plants, amphibians, bats) to provide a better understanding of the natural values of the Reserve.
2. Monitor trail restoration work if implemented and remove cages around planted native species if necessary.

7.4 Ongoing or Annual Action Items

1. Conduct annual monitoring to identify management concerns, including off-trail public use and invasive species.
2. Conduct ongoing maintenance of signs.
3. Continue to inform the general public of the natural values of the site and the permitted and prohibited uses through information placed in local publications.

8.0 Conclusion

Deep Ridge Nature Reserve is an important protected area in the Coastal Douglas-fir biogeoclimatic zone and on Salt Spring Island. Although impacted by logging, over time the land will develop into a mature forest. The Reserve provides important connectivity for wildlife habitat with Peter Arnell Park.

The Islands Trust Conservancy will act on the management action items identified in this plan to achieve the vision, objectives and purpose of the Nature Reserve. Future management issues may lead to further action items that will be identified in work plans and in future revisions of this plan.

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10.0 Appendices

Appendix A. Vegetation found in Deep Ridge Nature Reserve.

Common Name	Latin Name	Status
Abies grandis	Grand fir	
Acer macrophyllum	Bigleaf maple	
Achlys triphylla	Vanilla-leaf	
Adenocaulon bicolor	Pathfinder	
Aira praecox	Early hairgrass	Introduced
Alnus rubra	Red alder	
Amelanchier alnifolia	Saskatoon	
Anthoxanthum odoratum	Sweet vernalgrass	Introduced
Arbutus menziesii	Arbutus	
Berberis nervosa	Dull Oregon-grape	
Bromus vulgaris	Columbia brome	
Buckiella undulata	Flat-moss	
Campanula scouleri	Scouler's harebell	
Cardamine sp.	Bittercress	
Chimaphila umbellate ssp. *umbellata*	Common pipsissewa	
Corallorhiza sp.	Coralroot	
Dicranum sp.	Broom moss	
Crateagus monogyna	Oneseed hawthorn	Introduced
Digitalis purpurea	Foxglove	Introduced
Eurhynchium oreganum	Oregon beaked-moss	
Festuca occidentalis	Western fescue	
Galium aparine	Cleavers	
Gaultheria shallon	Salal	
Goodyera oblongifolia	Rattlesnake plantain	
Heuchera micrantha	Small-flowered alumroot	
Holodiscus discolor	Oceanspray	
Hylocomium splendens	Step moss	
Ilex aquifolium	English holly	Introduced
Linnaea borealis ssp. *borealis*	Twinflower	
Lonicera ciliosa	Western trumpet	
Lonicera hispidula	Hairy honeysuckle	
Luzula subsessilis	Short-stalked wood-rush	
Lysimachia latifolia	Broad-leaved starflower	
Melica subulata	Alaska oniongrass	
Moehringia macrophylla	Big-leaved sandwort	
Montia parvifolia	Small-leaved montia	
Mycelis muralis	Wall lettuce	Introduced
Nemophila parviflora var. *parviflora*	Small-flowered nemophila	
Osmorhiza berteroi	Mountain sweet-cicely	
Platanthera transversa	Royal rein orchid	
Polypodium glycyrrhiza	Licorice fern	
Polystichum munitum	Sword fern	

Prunus emarginata	Bitter cherry	
Pseudotsuga menziesii	Douglas-fir	
Pteridium aquilinum	Bracken fern	
Pyrola aphylla	Leafless wintergreen	Blue List
Quercus garryana	Garry oak	
Rhytidiadelphus triquetrus	Electrified cat's-tail moss	
Rosa gymnocarpa	Baldhip rose	
Rubus ursinus	Trailing blackberry	
Rumex acetosella	Sheep sorrel	Introduced
Russula brevipes	Short-stemmed russula	
Russula xerampelina	Shrimp russula	
Sanicula crassicaulis	Pacific sanicle	
Sedum spathulifolium	Broad-leaved stonecrop	
Thuja plicata	Western redcedar	
Tsuga heterophylla	Western hemlock	
Urtica dioica	Stinging nettle	
Vaccinium parvifolium	Red huckleberry	
Veronica officinalis	Common speedwell	Introduced

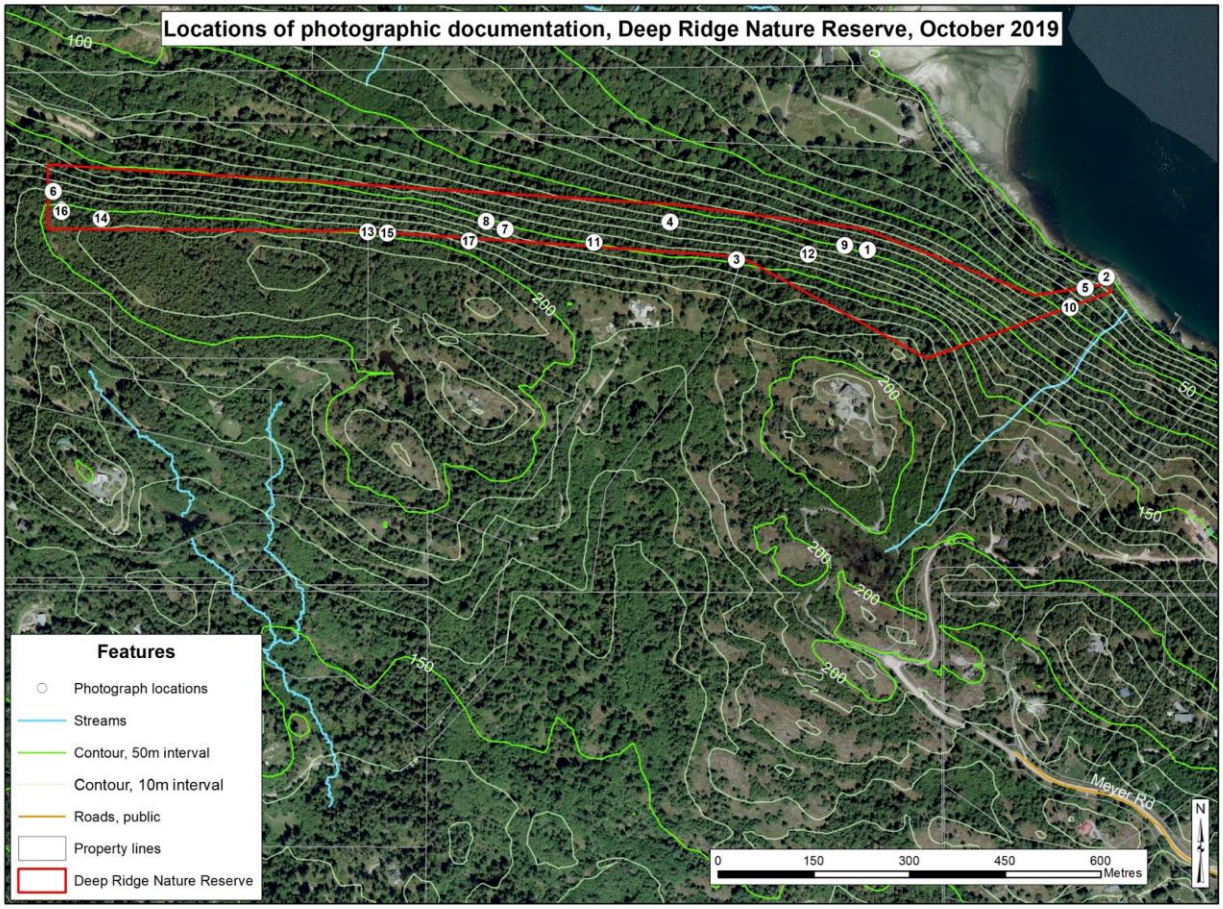
Appendix B. Photographic Documentation.

PHOTO STATION	LOCATION (UTM Coordinates)	DIRECTION	PHOTO-GRAPHER	DATE YYYY-MM-DD	DESCRIPTION
Anthropogenic Features as noted on Figure 2					
P3	468695; 5405576	71°	LM	2019-07-31	ITCC signs (2): "Trail Closed" and "Closed Area" signs
P4	468594; 5405638	293°	LM	2019-07-31	Old skid road with vegetation beginning to establish.
P13	468122; 5405622	105°	LM	2019-07-31	ITC signs (3): Boundary sign, "Trail Closed" and "Closed Area" signs
P14	467702; 5405644	345°	LM	2019-07-31	Well-worn train in western part of the Reserve off Peter Arnell Park with PARC/CRD boundary sign
P15	468133; 5405624	83 °	LM	2019-07-31	Closed area sign showing regrowth of vegetation over trail.
Natural Features as noted on Figure 2					
P1	468871; 5405602	100°	LM	2019-07-31	Maturing second growth forest
P2	469278; 5405552	178°	LM	2019-07-31	Shoreline of Deep Ridge Nature Reserve
P5	469205; 5405516	0°	LM	2019-07-31	Northern Red-legged Frog
P6	467627; 5405686	350 °	CM	2019-09-11	Large diameter blowdown
P7; P8	468314; 5405627	308° 188°	LM	2019-07-31	Centre of Plot 1, Ecological Community 1
P9	468871; 5405602	3°	LM	2019-07-31	Centre of plot 2, Ecological Community 1
P10	469219 5405521	80°	LM	2019-07-31	Centre of Plot 3, Ecological Community 1

P11	468474 5405606	73°	LM	2019-07-31	Patch of young, dead, standing wildlife trees
P12	468811; 5405588	166°	LM	2019-07-31	Turkey Vulture nest
P16	467631; 5405680	0°	LM	2019-07-31	Leafless wintergreen seed capsules
P17	468279; 5405614	225°	LM	2019-07-31	Small English holly plant

* LM=Laura Matthias

Map of Photographic Documentation.



Appendix C. Letter to Neighbours.

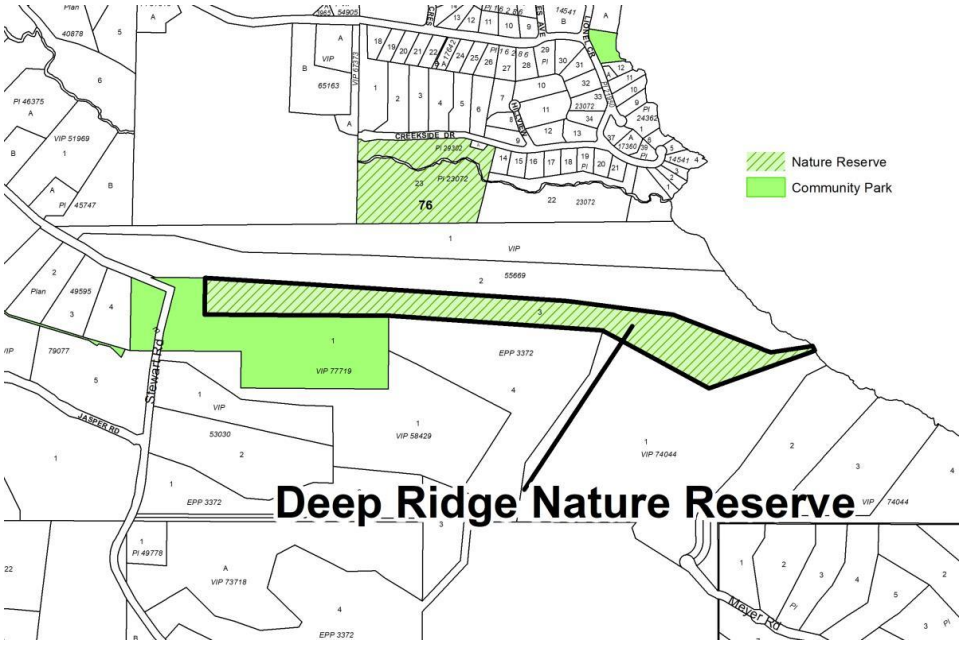
ISLANDS TRUST CONSERVANCY
Protecting Canada's Islands in the Salish Sea

November 29, 2019

Dear Neighbour,

The Islands Trust Conservancy is updating the management plan to guide management of the Deep Ridge Nature Reserve for the next 10 years and we are interested in hearing from you.

The Deep Ridge Nature Reserve (PID 018-031-552, Lot 3, Sections 75 and 76, South Salt Spring Island, Cowichan District, Plan VIP55669) is an 14.2-hectare (35 acre) protected area located on the southeast coast of Salt Spring Island, south of Cusheon Creek and adjacent to the Capital Regional District managed Peter Arnell Park.



The reserve was logged in the past and is currently a steeply sloping young forest, which will likely mature into a red-listed ecological community. There are a number of wildlife trees, primarily small diameter standing dead trees. Two species at risk have been observed on the land, leafless wintergreen and Northern Red-legged Frog. The Islands Trust Conservancy works to manage the property to protect its natural values, sensitive ecosystems, and threatened species.

PHONE: (250) 405-5151 · FAX: (250) 405-5155 · 200-1627 FORT ST, VICTORIA, BC, V8R 1H8
ITCMAIL@ISLANDSTRUST.BC.CA · WWW.ISLANDSTRUSTCONSERVANCY.CA

The Islands Trust Conservancy will work in partnership with the Ministry of Transportation and Infrastructure and the Capital Regional District who hold a conservation covenant on the Nature Reserve. There are restrictions on the use of the property, outlined in the covenant, that have been put in place to protect the native plants and animals within the reserve.

Your input is requested for the development of the next Deep Ridge Nature Reserve Management Plan. As a neighbour of the reserve, we would like to hear your ideas and concerns regarding the long-term management of this special place.

The enclosed questionnaire can be:

- completed online at https://www.surveymonkey.com/r/DeepRidge or through our website: http://www.islandstrustconservancy.ca;
- returned by mail to the Victoria office at 200 – 1627 Fort Street, Victoria, BC V8R 1H8; or,
- dropped off in person at the Islands Trust office on Salt Spring Island at 1 – 500 Lower Ganges Road.

  The deadline to complete the survey is January 20, 2019.

If you would like to share your input in person, I will be at Saturday market at Centennial Park, December 14th, 2019 from 10:30am to 12:30pm to ask for input about the Deep Ridge Nature Reserve, as well as the Lower Mt. Erskine Nature Reserve, management planning process.

Thank you for taking the time to share your ideas regarding management of the Deep Ridge Nature Reserve. For more information, please contact me at the phone number or email listed below.

Sincerely,

Nuala Murphy
Property Management Specialist, Islands Trust Conservancy 250-405-5193
nmurphy@islandstrust.bc.ca

PHONE: (250) 405-5151 · FAX: (250) 405-5155 · 200-1627 FORT ST, VICTORIA, BC, V8R 1H8
ITCMAIL@ISLANDSTRUST.BC.CA · WWW.ISLANDSTRUSTCONSERVANCY.BC.CA

Appendix D. Questionnaire sent to Neighbours and Available Online.

Deep Ridge Nature Reserve Questionnaire

Deep Ridge Nature Reserve, established in 1992, is a 14.2-hectare nature reserve located on the southeast coast of Salt Spring Island, south of Cusheon Creek. Deep Ridge Nature Reserve ranges in elevation from 0-200 m and is a strip of steeply sloping forested ridge that includes 14 metres of oceanfront. The Reserve provides a buffer to adjacent Peter Arnell Park and though it is currently a young forest after logging and fire approximately 60 years ago, it is an important protected area in the Coastal Douglas-fir moist maritime (CDFmm) subzone on Salt Spring Island.

The Islands Trust Conservancy's primary goal is to protect and nurture the sensitive ecosystems and natural values on this land. The information and actions required to achieve this goal and guide the management of the property are set out in a management plan that is updated every 10 years. We welcome community input and ask you to share your thoughts on the protection and long-term management of the Deep Ridge Nature Reserve.

1. Are you a resident of Salt Spring Island?

- ◯ Yes, I live on north Salt Spring Island
- ◯ Yes, I live mid-island
- ◯ Yes, I live on south Salt Spring Island
- ◯ No, I'm a visitor

2. Have you ever visited Deep Ridge Nature Reserve? If so, how often?

- ◯ No, never
- ◯ Once
- ◯ A few times
- ◯ A few times per year
- ◯ Once a month or more

3. If you have visited Deep Ridge Nature Reserve before, what did you do there?

- ◯ Hiking/walking
- ◯ Wildlife viewing
- ◯ Dog walking
- ◯ Other (please list):

4. Please list any wildlife and unique plant species you have seen in or near Deep Ridge Nature Reserve:

5. What do you believe to be the most important values of nature reserves? (choose three)

- ◯ Protection of habitat for at-risk species
- ◯ Ecosystem services (e.g. clean water and air, erosion control, groundwater recharge, etc.)
- ◯ Recreational opportunities
- ◯ Education and research opportunities
- ◯ Tourism
- ◯ Aesthetic appeal
- ◯ Conservation for the sake of the intrinsic value of nature
- ◯ Other (please specify):

6. What activities do you believe are incompatible with the protection of natural features, and should not be allowed within the Deep Ridge Nature Reserve?

7. What do you feel could be the greatest threat to the health of this nature reserve, and should be the highest management priority for the Islands Trust Conservancy?

8. Please provide any other relevant information that will help us make the best management decisions for Deep Ridge Nature Reserve.

9. Please share with us any history you know about this property or any knowledge you have about unique cultural or other special features on the property or in the area.

10. If you would like to receive periodic updates from the Islands Trust Conservancy on this and other conservation projects on the islands, please provide your name and email address:

Thank you for your time spent helping us plan the future of Deep Ridge Nature Reserve.

Appendix E. Letter to First Nations.

December 2, 2020

Dear Chief and Council,

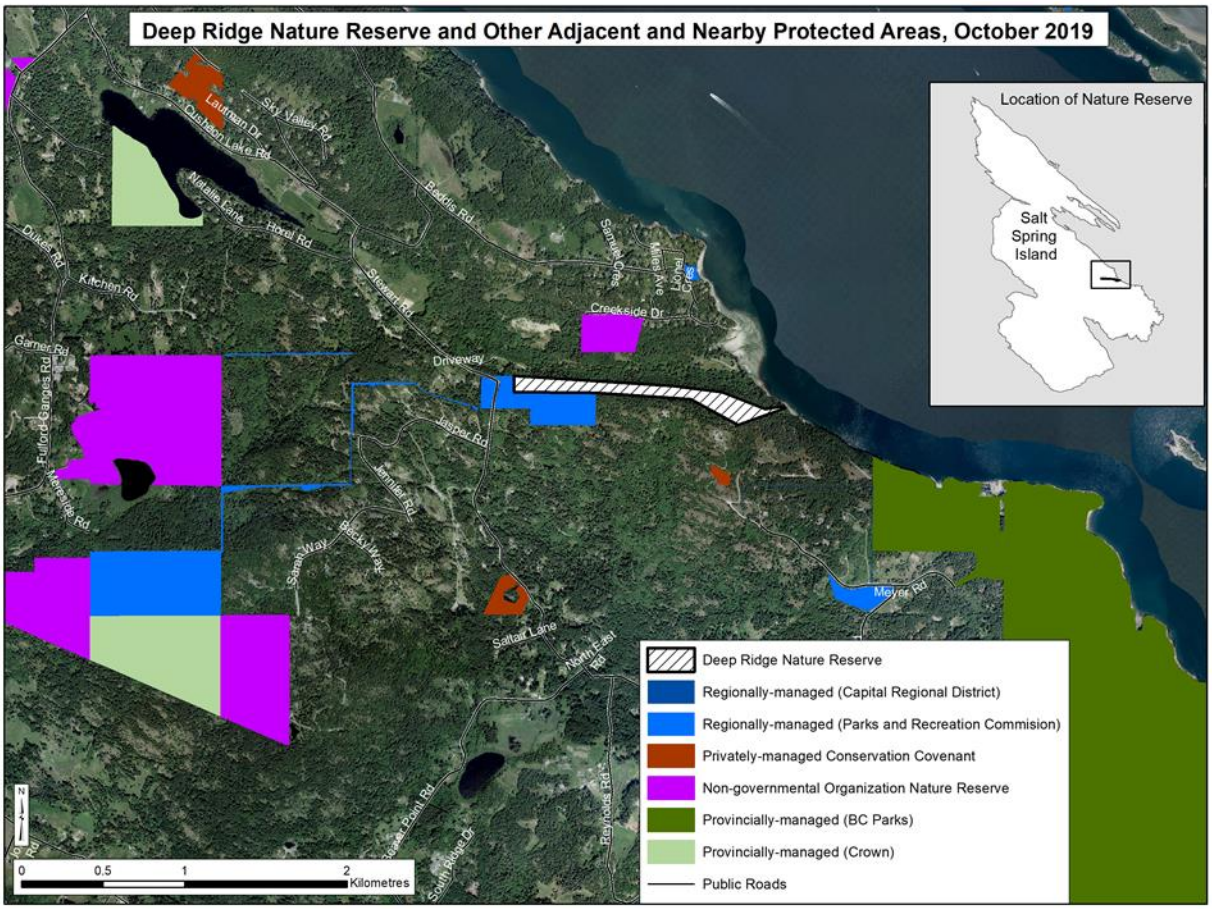
Re: Islands Trust Conservancy Nature Reserves on Salt Spring Island

The Islands Trust Conservancy, through its work as a land trust, is drafting management plans for the Deep Ridge Nature Reserve and the Lower Mount Erskine Nature Reserve on Salt Spring Island.

The nature reserves are within your First Nations treaty and/or territorial lands and waters and we want to ensure that the direction of the management plans is reflective of both reconciliation and conservation goals. At this time, ITC would like to work with you to understand the cultural significance and traditional use of the area so that these values can also be preserved and protected—now and into the future. We understand that the cultural significance of this land may be confidential and we would work with you to ensure that the management plan reflects this significance appropriately. Acknowledging the importance of naming and recognition, if there is signage, names, or place names that should be used for these areas please let us know.

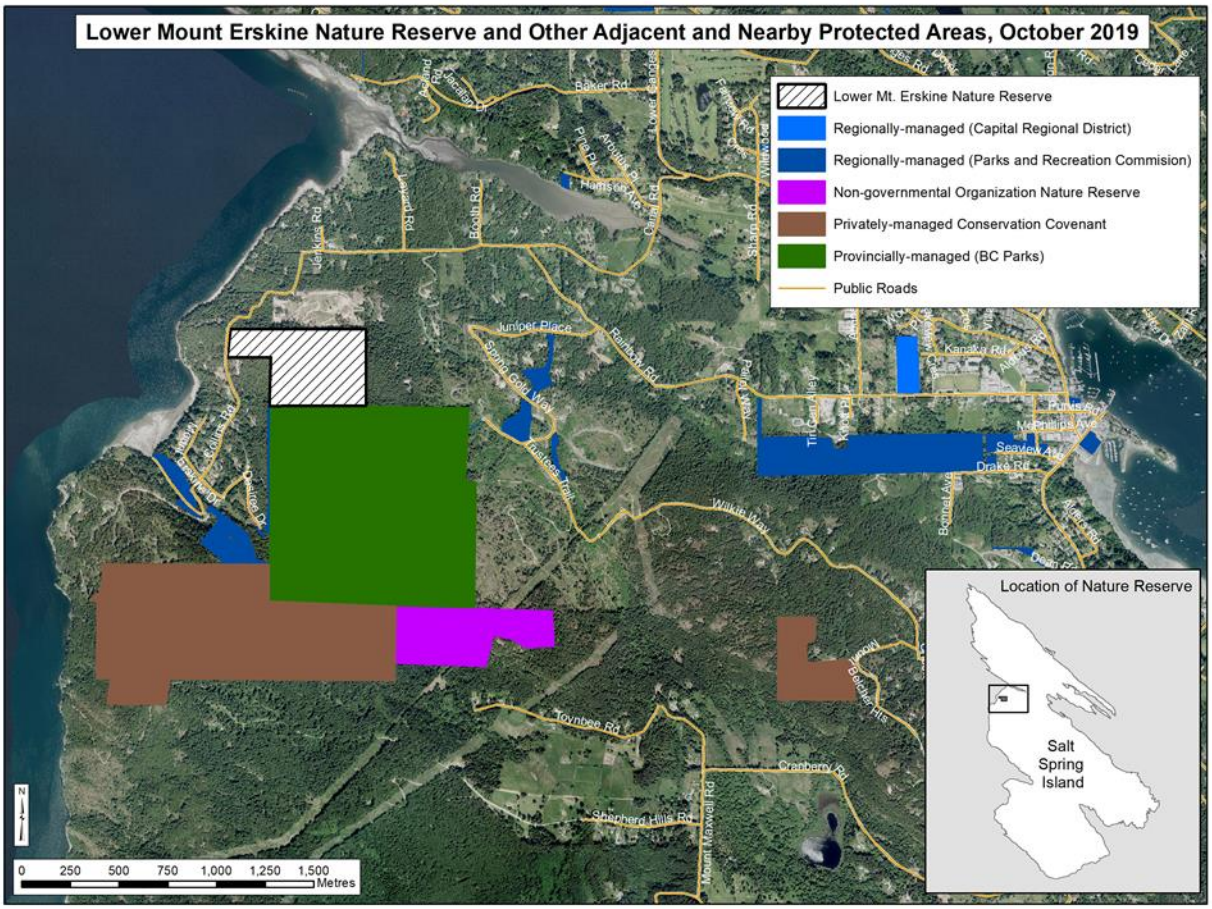
Deep Ridge Nature Reserve (PID 018-031-552, Lot 3, Sections 75 and 76, South Salt Spring Island, Cowichan District, Plan VIP55669) is a 14.2-hectare (35 acre) protected area located on the southeast coast of Salt Spring Island, south of Cusheon Creek and adjacent to the Capital Regional District managed Peter Arnell Park.

The reserve was logged in the past and is currently a steeply sloping young forest, which will likely mature into a red-listed ecological community. There are a number of wildlife trees, primarily small diameter standing dead trees. Two species at risk have been observed on the land: leafless wintergreen and Northern Red-legged Frog.



Lower Mount Erskine Nature Reserve (PID 001-384-333, Lot 3, Section 2, Range 1 and 2 West, North Salt Spring Island, Cowichan District, Plan 29481) is a 22-hectare (54 acre) protected area located on the northwest slopes of Mount Erskine between Booth Bay and Erskine Point on the northwestern part of Salt Spring Island.

Lower Mount Erskine Nature Reserve serves as an important green space, part of a 150 ha (372 acre) contiguous protected area when combined with Mount Erskine Provincial Park and the Salt Spring Island Conservancy managed Manzanita Ridge Nature Reserve. The diversity of elevations, aspects, moisture regimes, forest ages and habitat types in the reserve support a range of plant and animal species. ITC works in partnership with Nature Conservancy of Canada and Habitat Acquisition Trust, who hold a conservation covenant on this land to conserve its unique natural and ecological value.



Islands Trust Conservancy would like to undertake an archaeological review or traditional use study in collaboration with you. Islands Trust Conservancy passed a Reconciliation Declaration, committing to building relationships to work with your Nation to protect and manage the area and any cultural heritage sites in these nature reserves in a way that is reflective of treaty, inherent rights, and the territorial lands of your Nation.

You may also be interested to know that Islands Trust Conservancy has developed a draft management plan template that includes cultural heritage and spiritual significance. I would be pleased to provide it to you, as a starting point if you would like to comment on it.

Thank you for considering our request to work together. Please contact me at the number or email listed below. Thank you for your kind consideration.

Sincerely,

N. Murphy

Nuala Murphy
Property Management Specialist
Islands Trust Conservancy
250-405-5193 | nmurphy@islandstrust.bc.ca

Islands Trust Conservancy's Victoria office is located in Coast Salish territory and we acknowledge with respect the the BOḰEĆEN, Cowichan Tribes, Halalt, Homalco, K'ómoks, Klahoose, Ts'uubaa-asatx,
Lək̓ ʷəŋən (SXIMEŁEŁ, Songhees, T'Sou-ke), Lyackson, MÁLEXEŁ, Penelakut, Qualicum, Scia'new, səl̓ilwətaʔɬ, SEMYOME, shíshálh, Snaw-naw-as, Snuneymuxw, Sḵwx̱wú7mesh, SȾÁUTW̱, Stz'uminus, Tla'amin, scəẃaθən məsteyəxʷ, We Wai Kai, Wei Wai Kum, W̱JOŁEŁP, W̱SIḴEM, and xʷməθkʷəy̓əm territories in which we live and work.